

### **REMARKS**

Claims 1-88 are all the claims presently pending in the application. Applicant gratefully acknowledges Examiner's indication that claims 22-23 would be allowable if rewritten in independent format and that claims 1-19, 24-26, and 29-88 are allowed. However, Applicant believes that all of the claims are allowable. Claims 1-88 have been amended to more particularly define the invention.

It is noted that the claim amendments are made only to assure grammatical and idiomatic English and improved form under United States patent practice, and are not made to distinguish the invention over the prior art or narrow the claims or for any statutory requirements of patentability. Further, Applicant specifically states that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the allowed claim.

Claims 20-21 and 27-28 stand rejected under 35 U.S.C. §102(e) as being anticipated by Pei et al. (U.S. Patent 6,167,049).

The rejection is respectfully traversed in the following discussion.

### **THE CLAIMED INVENTION**

The claimed invention, as exemplarily defined by independent claim 20, is directed to a virtual output queuing (VOQ) controlling device in, for example, an input buffering switch with a virtual output queuing technique and an input buffering switch. A specialized class for constant bit rate (CBR) traffic and a connection request generation section makes a connection request for a switch scheduler, which can execute three-step priority control. The

connection request generation section makes connection request of the specialized class for a CBR traffic prior to the connection request of the other classes for the switch scheduler. As defined by claim 21 the virtual output queuing controlling device is in an input buffering switch with a virtual output queuing technique and an input buffering switch, includes a first specialized class for CBR traffic, a cell read-out controlling section that reads out the cells from each of the classes, and a connection request generation section that makes connection request for a switch scheduler, which can execute two-step priority control, when the connection request generation section receives a connection request from the switch scheduler, the cell read-out controlling section reads out the cells from the first class prior to the second class.

In a conventional packet switch, it is impossible to simultaneously realize a CBR service, which requires simultaneously guaranteed bandwidth and delay properties, and the minimum bandwidth guarantee-type service. This is, first, because of competition among the input interfaces, and second, because of competition among classes within the input interface.

The claimed invention, on the other hand, provides a VOQ controlling device that provides the CBR service together with the minimum bandwidth guarantee-type service in the input buffering switch with the VOQ technique.

## **THE PRIOR ART REJECTION**

### **The Pei Reference**

The Examiner alleges that Pei teaches the claimed invention described in claims 20, 21, 27, and 28. Applicant submits, however, that there are elements of the claimed invention,

which are neither taught nor suggested by Pei.

Pei discloses a scheduling process for asynchronous transfer mode (ATM) cell transmission, including an ATM segmentation and reassembly circuit. Pei discloses a combination of static scheduling and dynamic scheduling of ATM cell transmit opportunities (virtual circuit connections) to provide available bit rate (ABR) transport with a minimum cell rate greater than zero.

With regard to independent claims 20 and 21, Pei fails to disclose at least a **virtual output queuing (VOQ) controlling device with a virtual output queuing technique, comprising a specialized class for CBR traffic**. Pei fails to teach or suggest manipulation of a virtual output queue. Pei also fails to teach or suggest CBR cells being a specialized class.

Instead, Pei discloses a method of scheduling virtual circuit connections for those circuits which have a cell awaiting transmission. Pei, col. 5, line 37 – col. 6, line 37. “At the start of a packet, the segmentation engine 31 uses a region of the packet header to identify the particular ATM virtual circuit that the cells should be queued on. Each ATM virtual circuit is identified with one of several virtual path connections (VPC) and with a specific virtual circuit connection within the particular VPC.” Pei, col. 10, lines 2-7. Pei queues the cells to their respective circuits on a first-in, first out basis, and does not treat CBR cells as a specialized class when queuing cells to their circuits. “The segmentation engine 31 supplies the cells to a memory controller and scheduler 43. The controller and scheduler 43 stores the cells resulting from the segmentation in external SRAM (memory 29) for transmission by the cell transmit engine 33. In the simplified embodiment illustrated (Fig. 4), the transmit engine

33 includes a cell transmitter and scheduler 45 and transmit FIFO buffers 47 which connect to the transmit link portion 49 of the physical link interface port.” Pei, col. 10, lines 12-20.

Pei further fails to disclose a **connection request generation section** that makes a connection request for a switch scheduler, which can execute priority control characterized in that said connection request generation section **makes connection request** of said specialized class for a **CBR traffic prior to the connection request of the other classes** for said switch scheduler.

The Examiner alleges that such a feature is disclosed in packet relay engine 37 (col. 10, lines 64-67) and Fig. 5 (col. 11, lines 48-61). However, packet relay engine 37 is an input circuit for cells received from the ATM receive link. Packet relay engine 37 receives packets on a first-in, first-out basis and makes no connection request of the switch scheduler. Pei, col. 10, line 40 – col. 11, line 14. Pei Fig. 5 (col. 11, lines 48-61) is an example of a scheduling table, which the scheduler refers to when allocating virtual circuit connections; the table contains information identifying different levels of service priority, but no connection request is made when CBR traffic or other cell traffic is received from the output queue. Pei col. 12, lines 4-15, 27-31, 34- col. 13, line 23.

Therefore, Applicants submit that Pei has failed to disclose or suggest a virtual output queuing controlling device in an input buffering switch with a virtual output queuing technique, comprising a first specialized class for a CBR traffic and a connection request generation section that makes a connection request for a switch scheduler, which can execute priority control characterized in that said connection request generation section makes connection request of said specialized class for a CBR traffic prior to the connection request

of the other classes, as recited in independent claims 20 and 21.

With regard to independent claims 27 and 28, Applicants claim an input buffering switch comprising features substantially similar to those recited in claims 20 and 21. The Examiner has addressed claims 20, 21, 27, and 28 as a group. Applicants traverse the rejection of claims 27 and 28 on the same grounds as claims 20 and 21, above.

Therefore, Applicants submit that Pei has failed to disclose an input buffering switch comprising a first specialized class for a CBR traffic and a connection request generation section that makes a connection request for a switch scheduler, which can execute priority control characterized in that said connection request generation section makes connection request of said specialized class for a CBR traffic prior to the connection request of the other classes, as similarly recited in independent claims 27 and 28.

Applicants submit that there are elements of the claimed invention that are not taught or suggested by Pei. Therefore, the Examiner is respectfully requested to withdraw this rejection.

## **CONCLUSION**

In view of the foregoing, Applicant submits that claims 1-88, all the claims presently pending in the application, are patentably distinct over the prior art of record and are allowable, and that the application is in condition for allowance. Such action would be appreciated.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned attorney at the local telephone number listed below to discuss any other changes deemed necessary for allowance in a telephonic or

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personal interview.

To the extent necessary, Applicant petitions for an extension of time under 37 CFR §1.136. The Commissioner is authorized to charge any deficiency in fees, including extension of time fees, or to credit any overpayment in fees to Attorney's Deposit Account No. 50-0481.

Respectfully Submitted,

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